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Dated

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2442804-EE92203-1 002819
P01/7700 0-00-0409516.2 NONE

Request for grant of a patent

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THE PATENT OFFICE

A

29 APR 2004

NEWPORT

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1- Your reference

C927/H

2. Patent application number

(The Patent Office will fill in this part)

0409516.2

29 APR 2004

3. Full name, address and postcode of the or of each applicant (underline all surnames)

GEOFFREY DENIS HAYDAY

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Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

6380125001
England

4. Title of the invention

Filamentary powder reservoir

5. Name of your agent (if you have one)

Keith W Nash & Co

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

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Cambridge

CB2 1DP

Patents ADP number (if you know it)

1206001/

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

Yes

a) any applicant named in part 3 is not an inventor, or

b) there is an inventor who is not named as an applicant, or

c) any named applicant is a corporate body.
See note (d))

Patents Form 1/77

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Continuation sheets of this form

Description 6

Claim(s)

Abstract

Drawing(s) 3

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11. I/We request the grant of a patent on the basis of this application.

Signature Keith W Nash & Co Date 28/04/04

Keith W Nash & Co., Agents

12. Name and daytime telephone number of person to contact in the United Kingdom

Keith Nash 01223 355477

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Notes

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C927/H

Title: Powder dispenser

Field of invention

This invention relates to devices for dispensing powder such as talcum powder.

Background

It is known to package talcum powder in a rigid container having a dispensing nozzle at one end having a plurality of small holes therein through which powder can be dispensed by shaking the container, normally in a horizontal or inverted condition.

It is also known to package talcum powder in a flexible walled container also having a similar dispensing nozzle at one end through which powder can be forced by squeezing the flexible wall, whether inverted or upright.

A powder dispenser is described in US Patent Specification 4,730,751 in which a dip tube conveys powder to a discharge plug in a flexible walled container and a multicellular foam pad encases the lower end of the tube for effecting smooth and uniform movement, without clogging, of powder through the tube when the container is squeezed to discharge powder when the container is upright. The device includes air passages which allow air to pass directly to a mixing chamber in the plug and these can be covered by a similar foam pad to prevent clogging when discharging powder while the container is inverted.

Object of the invention

It is an object of the present invention to provide a modification to such powder dispensing containers and nozzles therefor, to allow more controlled dispensing of powder therefrom.

Summary of the invention

According to one aspect of the present invention within or associated with a powder dispensing nozzle of the type having one or more small holes through which powder can be ejected and located in the wall of a container partially filled with the powder which can be dispensed therefrom by squeezing the container to pressurize the contents, there is provided an intermediate powder reservoir on which some of the powder within the container becomes lodged by inverting or shaking the container, such that on subsequently squeezing the container, at least some of the powder lodging in or on intermediate reservoir is entrained in the air flow through the hole or holes, to be discharged therewith so that in general during each discharge action, only powder in or on the intermediate reservoir will exit via the nozzle.

The action of squeezing the container not only causes powder on or in the intermediate reservoir to leave the container via the hole or holes in the nozzle, but can also cause other of the powder in the container to replace at least some of the powder that has left the intermediate reservoir, so that the latter is at least partially replenished during each discharge action and is left ready to discharge another quantity of powder via the nozzle with the next squeeze of the container. Otherwise the reservoir can be replenished by shaking or inverting the container briefly.

Preferably the intermediate reservoir comprises a plurality of closely spaced but not touching elongate relatively rigid protrusions or pins or filaments or fingers similar to the bristles of a brush, which protrude inwardly of the nozzle towards the interior of the container. The filaments or fingers or pins may be of moulded plastics material and may be embedded at one end in a plastics plug having the one or more holes therein through which the powder can exit.

Although usually relatively rigid the protrusions, pins, or filaments or fingers may be flexible and may possess a degree of resilience.

The number of the filaments or fingers making up the reservoir, determines the surface area available to entrap the powder. In general the larger the number the greater will be the capacity of the reservoir to retain powder in its structure.

The invention is of particular application to dispensers having a flexible resiliently deformable container wall and which are operated by squeezing the wall to force air and powder out.

Thus the purpose of the intermediate reservoir is twofold. Firstly when squeezing so as to spray powder upwards, powder which has previously adhered to the filaments or fingers (following for example inversion or shaking of the container), will be entrained in the air flow and will be discharged as a single dose. Without the reservoir, all the powder would be in the lower end of the container and only a negligible amount could be entrained into the airflow created by squeezing the container, unless a dip tube is used which is undesirable since it can become clogged.

The second purpose is to limit the discharge from a nozzle in a container if the latter is squeezed while in an inverted or partially inverted condition. Typically in order to limit discharge in this situation the openings in a nozzle are made very small. However very small openings in the nozzle can easily become clogged when the container is inverted or partially inverted before being squeezed or shaken to dispense powder by trapping some of the powder in the intermediate reservoir from which it will be entrained in the air flow and eventually restricting access to the nozzle by the presence of the fingers or filaments larger nozzle openings can be employed thus reducing the risk of clogging. Without the intermediate reservoir, excessive amounts of powder can be discharged if the nozzle openings were to be increased in size.

Thus the use of the intermediate reservoir facilitates upward spraying, and can prevent nozzle clogging or excessive powder discharge, when discharging downwards, especially when ejecting powder by squeezing the container.

According to another aspect of the present invention a method of discharging powder such as talcum powder, from a flexible walled container having an outlet nozzle containing at least one and preferably a plurality of small openings at one end thereof and an intermediate reservoir in which powder can be retained internally of the openings in the nozzle for discharge through the openings, comprises the steps of inverting the container to charge the intermediate reservoir, and thereafter squeezing the flexible container wall to pressurise the contents of the container and cause air to run through the intermediate reservoir en route to the nozzle and in so doing entrain powder clinging to the fingers or filaments of the reservoir and thereby discharge powder through the outlet nozzle.

Preferably, prior to squeezing the container, it is rotated into an upright or near upright condition so that powder not retained by the intermediate reservoir falls away from the discharge end of the container so as not to be available to be discharged.

As used herein, the term flexible is intended to mean a container wall which is resiliently deformable by squeezing and will revert to its normal shape when the squeezing force is removed.

The invention will now be described by way of example with reference to the accompanying drawings in which:

Fig 1 is a cut away section through a powder container fitted with a tubular intermediate powder reservoir below the discharge nozzle.

Fig 2 is a plan view of a nozzle reservoir and employed in the contained of Fig 1.

Fig 3 is a perspective front elevation of the nozzle reservoir of Fig 2.

Fig 4 is a cut away section through a powder container fitted with another tubular intermediate powder reservoir in which a mesh of plastics material is fitted within the tube and

Fig 5 is a perspective front elevation of the nozzle reservoir of Fig 4.

In Fig 1 a powder container 10 containing a main charge of powder such as talcum powder 12 is provided at its upper end with a dispensing nozzle 14 the upper end of which includes four holes 16 through which powder can be discharged. This is achieved by squeezing the wall of the container, so as to force air and powder entrained therein, through the openings 16.

In accordance with the invention an intermediate powder reservoir is provided in the nozzle 14 in the form of a large number of elongate protrusions in the form of pins or filaments or fingers 18 which extend from the upper end of the nozzle so as to protrude into the container. If the container is shaken or inverted powder can become lodged on these protrusions 18 and the latter serve as a reservoir for powder. When the contents of the container are subsequently pressurised by squeezing the container wall air will be forced out through the holes 16, and in passing through the protrusions 18, powder clinging thereto will become entrained in the airflow and will exit via the holes 16.

A preferred nozzle reservoir is shown in Figs 2 and 3, and comprises a cylindrical plastics shell 20 having one end open through which the protrusions 18 can protrude and closed at the other end by a cap 22 within which the exit holes 16 extend.

The protrusions 18 are typically moulded at the same time as the shell is moulded, and whilst normally will be relatively rigid need not be so and may be flexible and may possess a degree of resilience.

The reservoir pins 18 may be arranged randomly or in a regular pattern and may be arranged along a spiral or helical pattern or in a series of spaced apart concentric rings.

An alternative design of reservoir is shown in Figs 4 and 5, where items which are similar to those shown in Fig 1 are denoted by the same reference numerals.

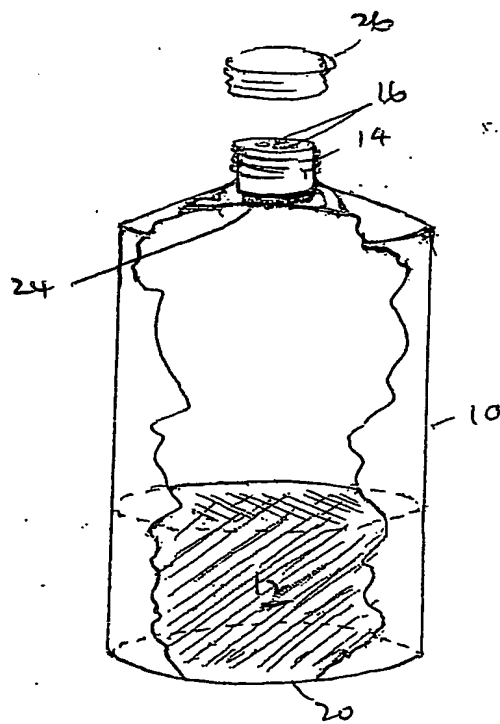
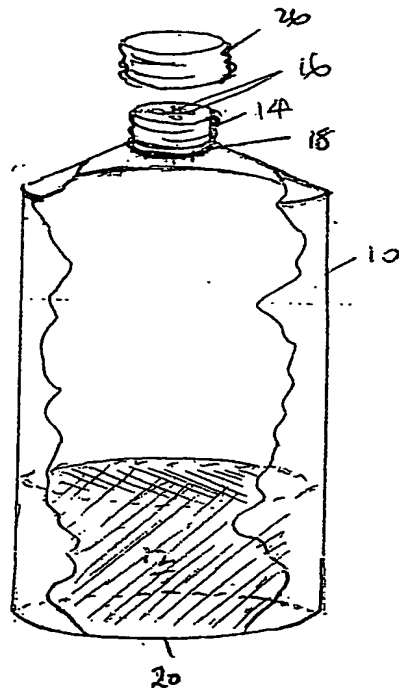
Here the pins 18 are replaced by a wad of plastics mesh 24 similar to a pan scourer. The act of shaking or inverting the container 10 will cause powder to become trapped in the mesh, for subsequent discharge, when the container wall is squeezed to pressurise the interior of the container, and force air not through the nozzle openings 16 which is passing through the mesh entrains some of the powder clinging to the mesh

The alternative intermediate reservoir is best seen in Fig 5.

Although four holes 16 are shown in the nozzle end it is to be understood that irrespective of the design of the intermediate reservoir any number of holes can be employed, and a nozzle having only one hole can be used.

A cap 26 is provided to prevent unwanted discharge of powder from the container. The cap may be a simple push-fit on the nozzle and cap may be formed with a complementary screw thread

A mixing chamber (not shown) may be incorporated into the nozzle but the invention envisages arrangements with or without such a mixing chamber and in particular can allow a dispenser to be made without the need for a dip tube to convey powder to the nozzle when discharge is to be effected with the container in an upright condition.



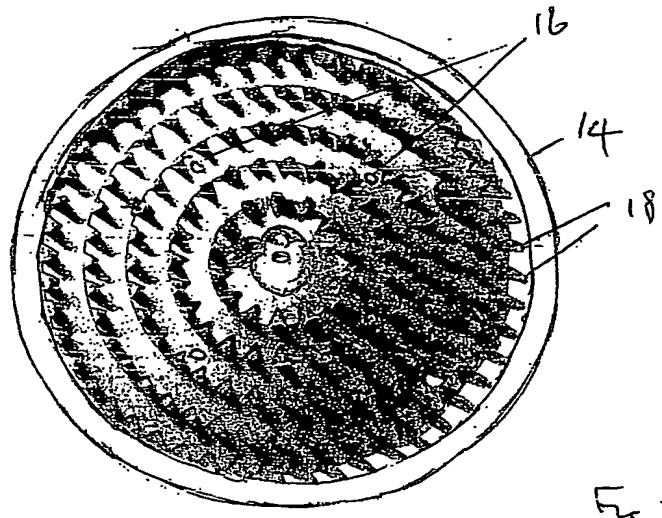


Fig 2

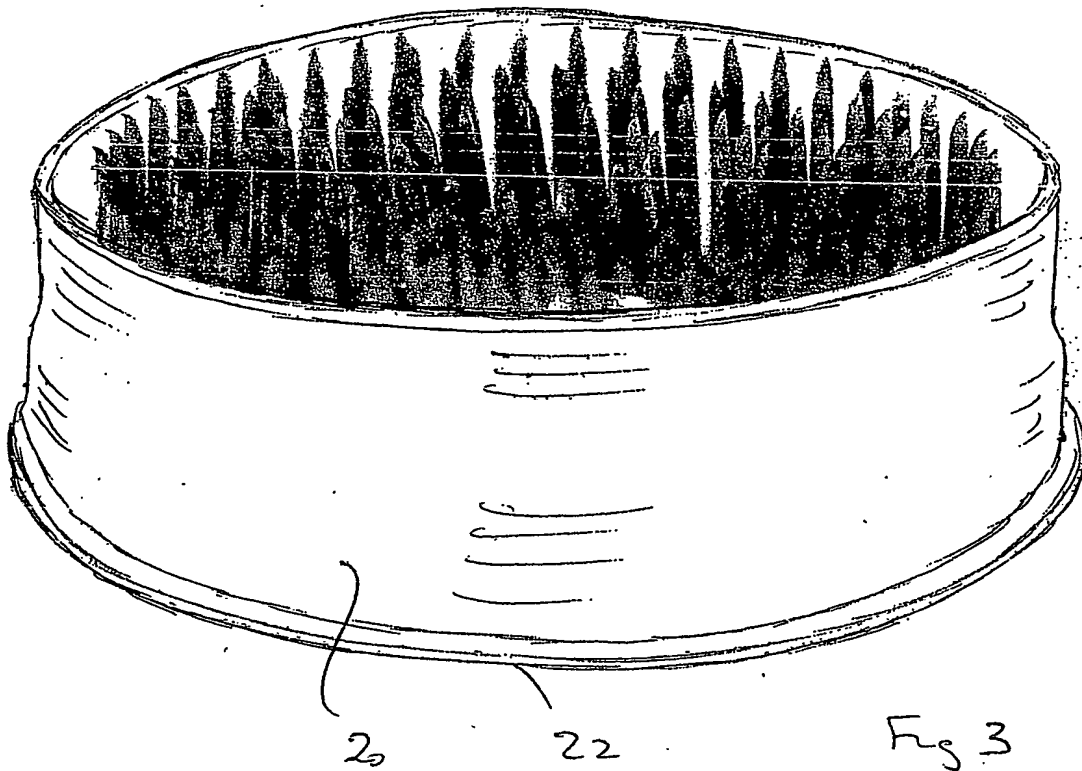


Fig 3

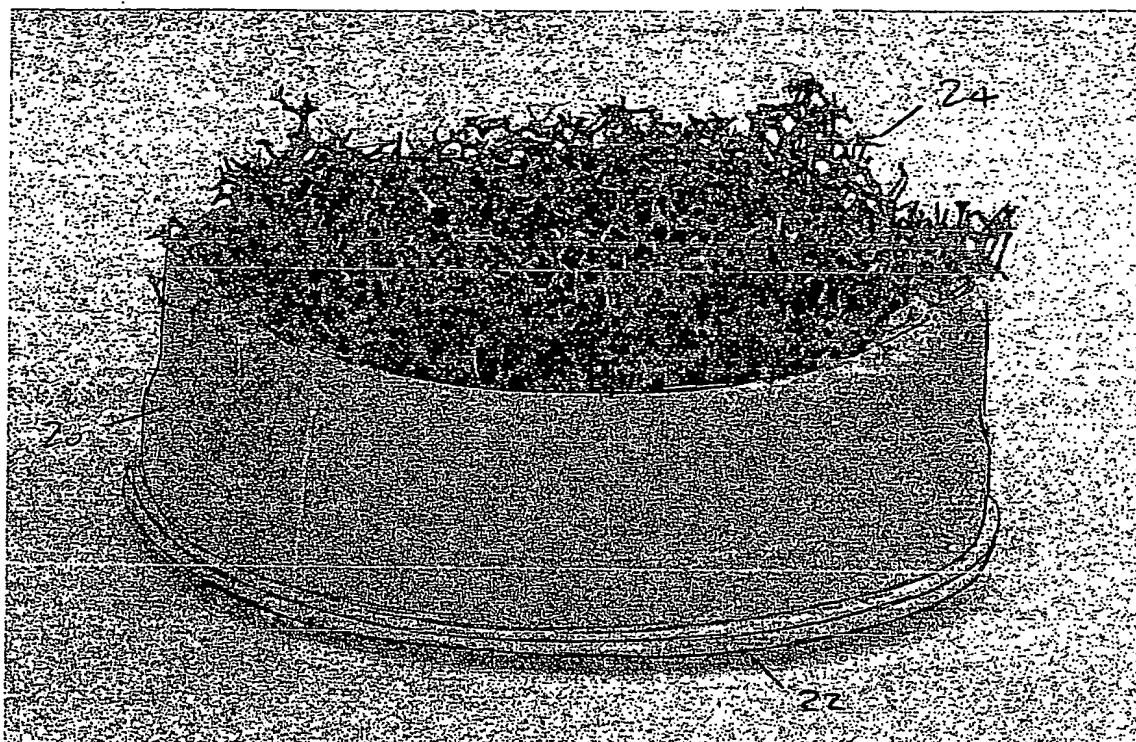


Fig 5

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